# Richmond Refinery LPS Bulletin-Reliability

## Alky- V-1440 ESP Failure

IMPACT ERM
Loss ID# 38106

**Location:**
Alky Plant
Cracking Division

**Contact Information:**
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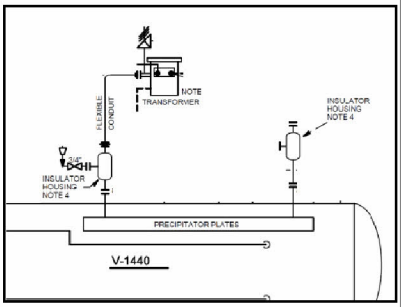


P&ID of V-1440 and the insulator housing

Image of failed insulator. Tracking indications can be seen.

**Tenets of Operations Violated:**

#6 – Always maintain integrity of dedicated systems

### Incident Description:

On March 9, 2012, the Electrostatic Precipitator (ESP) in V-1440 suddenly failed. The ESP had been operating reliably since the 4Q2010 Alky Major S/D. After a thorough review with all SMEs, it was decided that the Alky unit could run for 5 additional weeks until a planned outage was completed to repair the ESP. The unit was S/D on April 13th so that V-1440 could undergo an internal inspection and repairs of the ESP. This was a clock reset for the Alky plant.

### Investigation Findings:

1) Upon inspection, it was found that one of the two insulators (which protect the conductors that provide electrical charge to the ESP grid) had failed as a result of tracking.
2) The insulators were nearly 12 years old at the time of failure and were being routinely inspected every turnaround per the equipment manufacturer recommendations and guidance.
    1) Current Chevron Best Practices recommend replacing the insulators every 5 years. However, the investigation team found this recommendation was not clearly detailed anywhere and was not included in S/D events.
3) The insulators are located in the insulator housing that has a flush source. The equipment manufacturer recommends a constant clean flush to the insulator housing to avoid insulator failures. Our current system has shown a loss in flush for nearly 40 hours in 2011. This can lead to premature insulator failures over time.
4) In the 2000 Alky S/D, tracking indications were found requiring the insulators to be replaced after 5 years of operation. The equipment manufacturer had reported the insulators can last up to 15 years with proper flush. The indications found were a result of impurities or lack of flush. However, it appears that this recommendation from the OEM was never acted upon, implemented or investigated further.

### What Went Well:

1) Involving all the right people to assess the failure of the ESP and taking immediate action to monitor the unit until the planned outage once the ESP failed.

### Recommendations:

1) Work with the Best Practice team to change the procedures so that the requirement to replace the insulators every 5 years is clearly written in the ESP Best Practice document.
2) Issue new S/D PMs so that the insulators are replaced every 5 years during a Major Turnaround.
3) Perform a thorough design review of the flush system to make enhancements to reliability of the flush to the insulator housing.

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